From:	TARNOW Karen E
To:	Kristine Koch/R10/USEPA/US@EPA; Chip Humphrey/R10/USEPA/US@EPA; Eric Blischke/R10/USEPA/US@EPA
Subject:	FW: PCB mass balance
Date:	05/17/2010 08:24 AM
Attachments:	winmail.dat
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Hey folks - FYI

See below for a more complete question to an answer I asked at the
modeling workshop.

From: Carl Stivers [mailto:cstivers@anchorqea.com]
Sent: Friday, May 14, 2010 7:48 AM
To: TARNOW Karen E
Cc: Michael Werth; Kevin Russell; Amanda Shellenberger
Subject: RE: PCB mass balance

Karen -

The short answer to your question is that the RI loading analysis only
focused on "external" loads to the study area, and did not consider
"internal" exchanges in the system (with the exception of groundwater
advection). These internal processes that were not considered in the RI
are porewater exchange and sediment erosion.

One way to demonstrate that the RI did not consider these processes is
to look at the overall mass balance for tPCB using the values calculated
in the RI -- the overall mass balance for tPCB presented in the RI does
not "close". That is, when one sums the water column sources and
subtract the sinks, the total load calculated from those terms is lower
than the load that is estimated from the water column data at the
downstream end of the study area. For example, the RI shows (see Figure
10.2-3) that the tPCB load approximately doubles from the upstream end
of the study area to RM 4 - the data-based calculations from the RI do
not fully account for this load increase. Thus, you need an additional
flux to the river in order to explain the observed load gain in the
water column across the study area - that process is pore water exchange
from the sediment bed. Sediment erosion from the bed also contributes.
Since porewater exchange and erosion is included in the model, this
enables the model to capture the doubling of the water column load
across the study area.

In addition, the data-based loads calculated in the RI agree quite well
with the model for the processes that can be matched (e.g., load from
upstream, stormwater, groundwater). You can't assess this from the
modeling presentation since we only presented the terms on a relative
basis.

Hopefully this answers your question. If you would like any additional
information, please let us know.

Thanks.

Carl (on behalf of the Anchor QEA modeling team that worked on this
response).

Carl Stivers

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Hi Carl -

I asked this yesterday but still am not sure I understand what is going
on here. In simple terms (?), can you help me understand why the
relative proportion of the PCB load associated with the pore water (per
model) is so much more significant than the calculated load in the RI
Figure 10.2-2?

Seems like there must have been something very different about the
method for calculating the load in the RI as compared to how it is done
in the model. Was it the advection rate? Sediment depth? Etc.

Thanks

Karen

Karen Tarnow

Oregon DEQ

Portland Harbor Stormwater Coordinator

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